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Coimisiún Ḟiafruiġṫe
Maoin is Tionnscāl Éireann.
Commission of Inquiry into the Resources and Industries of Ireland

AD INTERIM
REPORT
ON
MILK PRODUCTION
MARCH, 1920.

THIRD EDITION

COMMISSION OF INQUIRY INTO THE RESOURCES AND INDUSTRIES OF IRELAND,
AMERICAN CHAMBERS, O'CONNELL STREET, DUBLIN.

Coimisiún Ḟiafruiġṫe Maoin is Tionnscal Éireann.

Tuarasgḃáil ad Interim Dálta Bainne.

Do toġaḋ an Ċoimisiún Ḟiafruiġṫe ċun eolas d'ḟaġáil dálta Maoin na hÉireann agus dálta na sliġe 'na ḃfuil Tionnscail na hÉireann fé láṫair agus ċun a ċeapaḋ cionnus aḃ ḟéidir níos mó feiḋme a baint as an maoin sin, agus caḃrú leis na tionnscail sin agus iad a ṁéadú. Ba léir nár ḃfolár i ḃfiosrú ċoṁ leiṫeadaṁail sin gaċ níḋ a bainfeaḋ leis a luaḋ go beaċt ċun ná tárlóċaḋ aon ċur trí ċéile, agus uime sin, do ṫoiġ an Ċoimisiún Coṁaltasaí ċun scrúduiġṫe láiṫreaċ i dtaoḃ dá aḋbar nár ċeart a ṁoilliú, .i. Bia agus Coṁaċt.

Do ṫáinig tuairiscí ós na Comaltasaiḃ sin i dtráṫ 'ġá ráḋ go raiḃ an oiread san eolais faċta aca gur ṁian leo a ṁolaḋ do'n Ċoimisiún socrú láiṫreaċ ar fiaḋnuise d'ḟaġáil um aḋbair áiriṫe. B'iad aḋbair iad san ná (1) Bainne agus Déantúsaí Bainne; (2) Iascaċ Mara agus Aiḃne; (3) Feoil agus Déantúsaí Feola; agus (4) Coṁaċt, pé'ca faċtar é ó Ṁóin, ó Ġual, ó Uisce, nó ó Alcohól. Dá ḃríġ sin, tá Seiseoin Puiblíḋe ḋá dtionólaḋ ag an gCoimisiún Ḟiafruiġṫe fé láṫair ċun fiaḋnuise do ċnósaċ i dtaoḃ na n-aḋbar san, agus fairis sin tátar ag faġáil eolais go lom díreaċ ó am go h-am fé mar a ceaptar gáḋ a ḃeiṫ leis.

Aċ, isé tuairim an Ċoṁaltais um Ḃia, toisc na fiaḋnuise atá faċta ag an gCoimisiún, nár ċeart a ṫuille moille a ḋéanaṁ le tuairisc i dtaoḃ Bainne na hÉireann. Ba léir do'n Ċomaltas go raiḃ fáṫ le h-imniḋe sa scéal. Do ṁotuiġeaḋ, leis, ná raiḃ ceangal ceart le ċéile ag mórán de'n obair a ḃí 'ġá ḋéanaṁ. Dá ḃríġ sin do ċuireaḋ an Tuarasgḃáil ad interim seo ċúġainn. Tá an Ċoimisiún Uile taréis an Tuarasgḃáil sin a ṁeas, agus tá órduiġṫe dúinne ár síġniġṫe a ċur leis, agus ar an gcuma san, glacaḋ leis mar Ṫuarasgḃáil ó'n gCoimisiún Ḟiafruiġṫe.

SEÁN Ó NÉILL, Ceann Coṁairle.

DARĠAL FIGES, Rúnaiḋe.

25 Márta, 1920.

COMMISSION OF INQUIRY INTO THE RESOURCES AND INDUSTRIES OF IRELAND.

Ad Interim Report on Milk Production

The Commission of Inquiry was appointed to inquire into the natural resources and the present condition of the manufacturing and productive industries in Ireland, and to consider by what means these natural resources may be more fully developed, and how those industries may be encouraged and extended. Perceiving that an enquiry of so wide a range would necessitate strict definition of procedure, if confusion were to be avoided, the Commission appointed Committees to examine at once two subjects of immediate importance, Food and Power.

These Committees in due course reported that they had so far prosecuted their initial inquiries as to recommend that the Commission should at once proceed to take evidence on certain selected subjects. These subjects were: (1) Milk and Milk Products; (2) Fisheries, Seaboard and Inland; (3) Meat and Meat Products; and (4) Power, whether derived from Peat, Coal, Water or Industrial Alcohol. The Commission of Inquiry is accordingly at present engaged in holding Open Sittings for the purpose of taking evidence on these subjects, in addition to such direct investigation as it judges necessary from time to time.

In the meantime it has seemed to the Committee on Food, from the evidence given before the Commission, that a report on the milk production of Ireland should no longer be delayed. It realised that there was cause for some apprehension on the matter. It felt, also, that much of the work already being done did not always appear to form part of a concerted scheme. It therefore sent down the following *ad interim* Report. That Report has now been considered by the Full Commission, and we are instructed to affix our signatures to it, and thus to adopt it as a Report of the Commission of Inquiry.

JOHN O'NEILL, *Chairman.*
DARRELL FIGGIS, *Secretary.*

25th March, 1920.

COMMISSION OF INQUIRY INTO THE RESOURCES AND INDUSTRIES OF IRELAND.

Ad Interim Report on Milk Production.

PRESENT POSITION OF THE DAIRY-INDUSTRY.

1. When it is remembered how large a part is played in the national economy by the Dairy Industry, it will be seen that any set of circumstances that may endanger its profitable conduct must be regarded as a national peril. Yet, the simple truth is that the whole of the industry is now being conducted, from month to month under just these conditions of peril, continuing, as it does, barely above the level of subsistence. This is a matter that should engage the earnest thought, not merely of those actually engaged in the industry, but of all who are concerned in the national health, economic and physical.

2. The facts speak for themselves. From a number of sources we have estimated carefully that the average yield of milk, per annum, amounts to not more than 420 gallons per cow. On the other hand, from evidence offered before us, and from estimates made from other sources—taking into consideration the cost of feeding on the one hand, and the price of milk on the other—it appears that the cost is such that no cow giving less than 380 to 400 gallons can be said economically to support herself. This figure has been estimated for cows maintained on land in dairy districts, not on land in the

vicinity of cities. It will be seen, therefore, that a yield of 400 gallons per cow may, with safety, be taken as near the lowest margin at which a cow maintains herself.

3. Therefore it appears that the whole of the Dairy Industry, taken for all Ireland, exists within a margin of 20 gallons per cow, per annum, of bare subsistence. The price of food stuffs is constantly rising. On the other hand, we have had grave warnings offered in evidence before us, to the effect that trade relations with Russia will bring into the markets now supplied by Ireland large imports of Siberian butter. The immediate result of this would be a depression in the price of the chief product manufactured from Irish milk. But the least increase in the price of food stuffs, or the least depression in the price of milk or milk products, would at once threaten the whole Irish Dairy Industry as an effective business proposition.

ANALYSIS OF THE PRESENT POSITION.

4. A further examination of these figures proves more assuring, however, assuming that Irish farmers are sufficiently alive to their own true interests to take steps to place the Dairy Industry on a more secure foundation. To get an average of 420 gallons per annum, per cow, it will be seen that a number of cows may give an average of 200 gallons, and other cows an average of 600 gallons. The actual figures are even more striking. From evidence given before us, and from returns made by Creamery Managers and others for the use of the *Commission of Inquiry,* it appears that there is a large number of cows in the country giving an average of about 800 gallons. We have examined attested figures of cows that now regularly give an average of from 1,200 to 1,400 gallons. From this it appears that there is a large number of cows in the country that are giving a yield no higher than 200 gallons.

5. That is to say, there is a large number of cows actually not paying for the cost of the food they are eating, and, year-in year-out, are costing farmers a considerable sum for their unprofitable maintenance. It seems remarkable to us that there should be so many shrewd farmers willing to undertake this cost of maintenance when there are so many other more worthy outlets for their charity.

6. It will be seen that if all the cows giving less than 400 gallons per annum were elimated, the average milk yield, per cow, would be increased

for all Ireland by 25 to 50%, without any further measures required directly to increase that yield. In other words, by the elimination of unprofitable cows the whole of the dairy industry would be placed beyond fear for the immediate future.

THE CASE FOR THE INDIVIDUAL FARMER.

7. Unfortunately, farmers do not know the unprofitable cow from the profitable. There is no basis for the prevalent idea among farmers that good milkers can be known by sight. An actual test, the tables of which are before us, was taken in connection with a Cow-Testing Association in Munster. The President of the Association was a man who owned a herd of 18 cows, and himself milked 6 cows throughout the year. As a man of knowledge and experience, he picked what he judged to be the best milker of his herd. When the year's record came before him, he discovered that his choice appeared in the 9th place in the herd of 18. In another case, in the same district, a number of farmers were asked to examine the cows that came in to be milked, each of them to pick out the cow that, in his judgment, would give the most milk. In no case did the farmers pick out the right cow. In fact, the majority of the cows selected did not even give a moderately high milk yield.

8. Often it occurs that a farmer will think highly of a cow if it flushes well at the beginning of its milking period, though, in fact, it often happens that such cows prove the worst in the end.

METHODICAL TESTS TO REPLACE GUESS-WORK IN THE DARK.

9. It cannot, therefore, be too strongly emphasised, that, if the Irish Dairy Industry is to be placed on a secure economical foundation, methodical tests will have to replace the guess-work in the dark by which it is now so largely conducted, so far as most farmers are concerned. Even as curds must be separated from whey before the scientific manufacture of cheese can begin, so economic milkers must be separated from "wasters" before the scientific conduct of the whole of this industry can be said to begin. It is the first essential. Not only is it the first essential for the Dairy Industry, but also it is vital for the whole national life, in which that industry plays so large a part.

10. At the present range of prices if, by the elimination of bad cows, and their replacement by good cows, the average yield of milk per cow, per annum, in Ireland can be increased from 400 gallons to 700 gallons, the industry

would be turned from a perilous enterprise into one of security, and the total increase in the national wealth, per annum, would amount to £20,000,000. And that great result is well within attainment.

SOME PRACTICAL FIGURES.

11. A few figures will suffice to enforce this from the point of view of the individual farmer. We take the figures furnished by one Cow-Testing Association, for 1918. There were 386 cows on test for the full milking period. Their average yield was 443 gallons. Their average was 3.6% of butter-fat. They produced 165¾ lbs. of butter-fat, equal to 193 lbs. of butter, at 2/- per lb. That is to say, £19 6s. 0d. per cow. The value of the skim milk, at 3d. a gallon, gives an average of £4 8s. 0d. per cow. In short, the Total Average Earning of each cow amounted to £23 14s. 0d. The Annual Total Cost of feeding each cow may be estimated at £18. This does not include the cost of labour. In a word, then, each cow, taken in the average, made a profit on its feeding of £5 14s. 0d., without reckoning the price of the labour involved. And the average yield of these 386 cows on test was 23 gallons higher than the average for the whole country.

12. An analysis of the details of the figures of this Association gives the following results :—

	Av. Age.	Av. Yield.	Av. Test.	Av. Butter Fat	Av. Butter Yield.		Skim Milk, 80 per cent., at 3d. per gal.	Total Av. Earning.
10 Best Cows.	6½	830	3.6	320	373 at 2/-,	£37 6 0	£9 3 6	£46 9 6
10 Poor Cows.	7½	210	3.4	71	83 at 2/-,	£8 6 0	£2 0 0	£10 6 0
Difference		620	.2	249	290	£29 0 0	£7 3 6	£36 3 6

It will be seen that the 10 best cows earned, collectively, for butter at 2/- per lb., and milk at 3d. per gallon, £464 16s. 0d. The 10 poor cows earned £103. That is to say, a difference of £361 15s. 0d. between these two lots of 10 cows each in the same district.

What this means in the case of particular cows may be seen in the following particulars of two mature cows taken from the same Association ;—

Age.	Calved.		Gals.	Test.	
(A) 9 years.	18/3'18	Milked 43 weeks	1,139	3.7 per cent.	*Contd.*
(B) 10 years.	25/3/'18	Dry in 29 weeks	237	3.0 per cent.	
Difference			902	.7 per cent.	

	Butter Fat.	Butter.	Skim Milk.	Total Earning.
Continued	437½lbs.	510lbs. at 2/-, £51 0 0	£11 7 9	£62 7 9
	76 lbs.	88lbs. at 2/-, £8 16 0	£ 2 7 6	£11 3 6
	361½lbs.	422lbs. £42 4 0	£ 9 0 3	£51 4 3

In the above, 80 per cent. of the whole milk is recorded as skim milk. It is important to note that the value of the good cow's skim milk at 3d. per gallon was more than the value of the total butter and skim milk of the poor cow. That is to say, £11 7s. 9d., as against £11 3s. 6d.

13. It would be possible to repeat such figures almost indefinitely. The above table has been chosen, however, as typical of many others, and is estimated in current prices. The following further table, however, may also be given as showing the results when applied to the herd of one particular farmer of this Association. This farmer owned a herd of 5 cows, and the following are the particulars of each cow of his herd :—

	Calved.	Age.	Gals.	
No. 1	25/3/'18	8 years	814	*Continued*
No. 2	22/4/'18	5 years	586	
No. 3	15/3/'18	11 years	445	
No. 4	18/5/'18	12 years	388	
No. 5	23/5/'18	7 years	259	

Continued	Butter.	Skim Milk at 3d.	Total.
No. 1............	301 at 2/-, £30 2 0	£5 17 0	£38 9 9
No. 2............	205 at 2/-, £20 10 0	£8 7 9	£26 7 0
No. 3............	165 at 2/-, £16 10 0	£4 9 0	£20 19 0
No. 4............	142 at 2/-, £14 4 0	£3 17 6	£18 1 6
No. 5............	84 at 2/-, £ 8 8 0	£2 11 9	£10 19 9

If we deduct, say, £18 for cost of food, it appears that :

No. 1 showed a PROFIT of ... ... £20 9 9 per annum.
No. 4 ,, ,, PROFIT of ... ... £ 0 1 6 per annum.
No. 5 ,, ,, LOSS of ... ... £ 7 0 3 per annum.

This last table is all the more interesting because it reveals the true position. From 4 of his cows this particular farmer made a profit of £31 17s. 3d. From the whole of his herd he made a profit of £24 17s. 0d. If his worst cow had died and he had continued with the other 4, he would actually have been richer at the end of the year by the sum of £7 0s. 3d. Whereas, if he had sold the worst and replaced her by one equal to the third best, he would have converted his loss of £7 0s. 3d. to a profit of £2 19s. 0d., raising his total profit from his herd from £24 17s. 0d. to £34 16s. 3d.

14. A closer examination of the above figures will reveal a further important fact, from the point of view of the farmer alive to his own interests. A cow giving a milk yield of 450 gallons (that is to say, a higher yield than the average yield of the country) is a paying proposition, though barely a paying proposition. But from that point onwards, every further gallon is clear profit. Therefore, a farmer, with one 800-gallon cow, is making as much profit from his milk as another farmer with a herd of eight 450-gallon cows. This is taken simply on the cost of feeding, without considering the labour cost of milking eight cows as against the cost of milking one cow. For it must be clearly recognised that the cost of feeding an inferior milker is very little less than the cost of feeding a good milker, and the cost of labour is approximately the same, cow for cow.

INCREASE IN BUTTER-FAT PERCENTAGE.

15. The same examination will also dispel a notion, prevalent in some places, that to increase the milk yield is to depreciate the percentage of butter-fat. Even if this were the case, the result would be an actual increase in the yield of the total butter-fat. But on nothing have the witnesses who appeared before us been more certain than this, that there is nothing discordant between a high milk yield and a high percentage of butter-fat. That has been affirmed by every witness, and it is amply supported by the figures from which we have already quoted. A cow giving a high yield of milk may also give a high percentage of butter-fat, and a cow giving a poor yield of milk may give an even proportionately poorer percentage of butter-fat. We think it is full time, therefore, that the notion prevalent among many farmers that to increase the yield of milk is necessarily to decrease the percentage of butter-fat, should now finally be laid to rest. It may be true that certain breeds of cows give a lower percentage of butter-fat than others. But this has nothing

to do with the yield of milk. Both yield of milk and percentage of butter-fat must be brought each to its own independent test.

RECOMMENDATIONS.

16. No dairy farmer should be content until he knows exactly the milk yield of his cows, with the butter-fat test of those yields, cow by cow. Not until he knows this can he know whether his cows are supporting him and his family, or whether he and his family are supporting worthless cows. This is the first essential of the conduct of his farm as a business concern. Farmers who do not take the trouble to get at this information are, perhaps, riding more quickly for disaster than they at present realise, although the power now lies in their hands of turning possible disaster into certain profit. Yet it is not merely a question affecting the individual farmer. It is vitally necessary in the interest of the nation as a whole. And the argument, therefore, is not merely directed to his self-interest, but even possibly more to the instincts of his true patriotism.

17. We, therefore, recommend :—

(*a*) Introductory to the establishment of proper Cow-Testing Associations, with paid Supervisors, that Creamery Managers should record for the information of the farmer his position month by month. From the Creamery Managers we have seen before us, we are convinced that Managers, as a whole, would very heartily co-operate with their suppliers in this matter. This can be effected by the following simple measures, that need only entail the keeping of an extra column in the Manager's book. The Manager should be informed by each supplier of the exact number of cows being milked by him. By checking this with the amount of milk supplied, the farmer will be able to know at once what is the average yield of his herd, so that he can compare it with the average yields of the herds of his neighbours. The result to the farmer would be considerable. Emulation would be stirred. An incentive would be supplied for the later creation of a proper Cow-Testing Association, and the farmers' minds would become familiarised with the general idea of such Associations. For if a farmer were able to discover, in his own proper interests, that the average yield of his herd was not comparing well with the average yield of a neighbouring herd, we do not believe he would rest satisfied until he had discovered the exact cows that were reducing his average. He would become awake to the fact that there were cows in his herd that he was maintaining at a dead loss to himself.*

(*b*) This would lead to the natural creation of proper Cow-Testing Associations. Yet it need not delay their establishment, where farmers are now prepared to undertake them. As in all business, this is a matter of self-help, and involves the farmer's proper conduct of his own business. We are not of the opinion that State Monies should be expended, either in the establishment, or in the support, of Cow-Testing Associations, and we do not believe that farmers, alive to their own interests, should require such outside expenditure. We are aware that to-day such assistance is even proving a hindrance, for many farmers consider the visit of a State Official as an inquiry into their business management, introductory to the discoveries of Income Tax Assessors. Where Creameries exist they form natural centres for Cow-Testing Associations. It should be the business of every Creamery Committee in the country to see that Supervisors are appointed, to work from the Creamery as their base of operation. This should be begun with farmers, who, under (*a*), show the worst average, with a view to helping them to discover the particular cows that are pulling down their average. In due course, then, all the farmers who supply the Creamery could be brought within the scheme. Naturally, it is not possible for a Supervisor, effectively, to undertake the examination of more than a certain number of farms†. Therefore, as the scheme develops, suppliers should be grouped together, district by district, each group of suppliers having its own Supervisor. As it is of the very first importance that Supervisors should not be subject to any human influence in the taking of their records, it would be further advisable if they were moved about from group to group, month by month.

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* The above scheme was first adopted by the Whitecross Co-operative Agricultural and Dairy Society some years ago. It was not adopted for the purpose suggested in the Report, but with a view to the Co-operative Insurance of Milch Cows. Each farmer informed the Manager of the Whitecross Creamery of the number of cows being milked by him, and it was thus possible to estimate the average milk supply per cow of each separate herd, with a view to estimating the amount of compensation to be paid to its owner in the event of its death. An incidental result was that each farmer was enabled to know the average yield per cow of his herd in the manner suggested in the Report. There is no reason why Milch Cow Insurance should not become, in the above scheme, a further practical result of the information so gained.

† Thirty farms is the number usually accepted as the approximate limit.

Supervisors, where they now exist, are paid, in most cases, a most unsatisfactory wage. Skilled work of this kind should be properly paid. Part of the cost might be borne by a weekly contribution from farmers directly, and the remainder by the Creamery. If this work is properly done, in our judgment, the expenses of these Supervisors will prove a sound investment. Certainly a better investment than to leave money lying in the bank.

(*c*) In districts where Creameries do not exist—and even in districts where Creameries do exist, supposing these Creameries have not sufficient initiative to undertake this work—the work should be organised by parishes or chapel-areas. Those who wish to do effective work for the country could help greatly by bringing meetings of farmers together, with a view to the establishment of such Cow-Testing Associations. We append, at the foot of the Report, the cost of the implements required.

(*d*) That Cow-Testing Associations, whether formed in conjunction with a Creamery or independently, should be represented in a National Dairy Council, which will be dealt with in a further Report. One of the functions of this Council should be to bring about a uniformity of practice throughout the country within Cow-Testing Associations, and also to undertake propaganda in parts of the country where Cow-Testing Associations have not been established, with a view to bringing the whole country into one uniform scheme.

(*e*) Finally, active propaganda should at once be set up throughout the country, with a view to bringing the above measures into effect. This question is largely a matter of education. The proposition is so self-evident, and the danger so real, that farmers only need to realise the truth of the position for them to become awake to the necessity of action. The best methods must needs fail until the public mind is aware of their necessity. Persuaded, as we are, of the necessity of the above measures that we have advocated, we urge that active propaganda should be carried out by national workers in every part of the country, in order that farmers who remain content with the present state of affairs, and do not, at once, take measures to remedy them, stand charged before their fellows with national negligence.

18. To enforce this part of our case, it is only necessary to point to what other nations have done. In most other countries, proper milking records are now systematically kept. As a result, in Canada, the milk yield per cow, per annum, has been increased by 245 gallons. In Sweden it has been increased by 200 gallons. In Demark the butter-fat production, per cow, has been doubled. In these countries the average yield, per cow, per annum, amounts, in all cases, to over 750 gallons. In Holland, a country with few natural advantages for dairying, the average is 850 gallons; and each cow is tested and weighed once a fortnight, morning and evening, by a certificated official. Admittedly, none of these countries is naturally so suited for dairying as Ireland. Certainly what other countries have done, Ireland can do, assuming that Irish farmers take the same measures, and are equally alive to their own interests.

19. We believe that, if similar records were kept in Ireland, farmers would soon become aware that many cows they now consider the highest in milk yield may be the lowest.

. . . They would become aware that cows they now fatten as poor milkers are really, in fact, good milkers.

. . . They would have an excellent indication of a cow's health in her milk yield.

. . . They would be able to modify the cow's food ration in proportion to the milk given.

. . . A closer intimacy would be created between them and the individual cows of their herds.

. . They would be wealthier in individual gain, and would contribute more truly to the national health.

. . Finally, they would acquire a practical knowledge that they do not at present possess.

BULLS AS WELL AS COWS.

20. By these means each farmer will be able to know his bad milkers from his good. He will be able to eliminate cows that are, at present, a dead loss to him. Yet these measures can only be a beginning. It should be remembered that the milking properties of cows are hereditary, and that the bull is not less important, but probably more important, than the cow herself.

The progeny of the best cow, impregnated by a bad bull, will reduce the average for the whole herd. Indeed it has been stated several times in evidence before us that the milking properties of a cow derive rather from her sire than from her dam.

21. It should, therefore, be remembered that, after the good cows have been separated from the bad cows, and unprofitable cows eliminated, the remaining cows should not be served except to bulls of recognised milking strains. When a bad bull has been discovered, it should at once be eliminated from the district as a public danger.

22. At the present moment, however, not only do farmers not know their good cows from their bad, but they do not know good dairy bulls from bad. It has been stated in evidence before us that farmers now, systematically, sell their bulls after two or three years' service, before they know the milk results of their progeny. They then may discover that the bull they have sold was one they should have kept. Farmers should, therefore, combine in their Cow-Testing Associations not to permit any bull to be retained in or introduced into their district unless either of a recognised milking strain, or of approved milking record.

23. It is clear that this is a vital matter. Until it is met an improved record will at once tend to slip back to the old level, and farmers will be discouraged in a continual up-hill fight. Bad bulls, however described, will always be infecting herds with the evil, from the dairy point of view, of poor milk production. If the whole problem is to be met at the outset in any adequate fashion, a beginning must therefore be made with the provision of bulls that are, not less than cows, bred from good milking strains. Something has been done in this direction already, but more could, and should, be done.

24. Several witnesses stated their conviction, in order that this should be accomplished, that proper breeding Studs should be brought into being in different parts of the country under State auspices. With this opinion we concur. We are further of opinion that such Studs, while at first requiring an initial outlay of expenditure and organisation that farmers could not be expected to provide, would, and should, before long be able to pay for themselves.

FURTHER RECOMMENDATIONS.

25. We, therefore, further recommend :—

(*a*) That, for a beginning, one Stud Farm should be established in each province, and that its books and records should be kept on the strictest lines. These Stud Farms should, of course, be established in suitable dairy districts—preferably where there are no well-equipped private Stud Farms at present. And for all such farms bulls of the best milking strains should be purchased, in order that, before their service to neighbouring farmers at proper fees, they may be tested on the home farm. Then, when the stock is sufficiently increased, and is tested and approved, heifers might be sold to neighbouring farmers, and bulls in the same way sold, or let out to trustworthy persons for use in their neighbourhood at approved fees and conditions, provision being taken in all cases to insure against their export from the country. Preference would naturally be given to farmers belonging to Cow-Testing Associations.

(*b*) That bulls of a dairy pedigree should be certificated; that farmers should not permit service by a bull without a certificate; and that this certificate should state the dam and sire of the bull so certified.

(*c*) That no certificated bull should be sold before 7 years, unless under exceptional circumstances.

(*d*) That bulls, as well as heifers, should be registered by name and number; that farmers, when purchasing milch-cattle, should insist on knowing their sires and their dams; and that both sires and dams should be entered at the head of each separate record.

(*e*) That any bull that fails to produce a good milking strain should be fattened for beef or removed to a non-dairy district before further damage is done to dairy herds.

26. We have stated before, and for emphasis we repeat, that such Stud Farms should pay for themselves, and repay their capital expenditure. Probably no better national investment could be made than the immediate establishment of such farms.

SELECTION OF HEIFERS.

27. The purpose of Cow-Testing is that, by testing year after year, farmers are provided with an invaluable guide for selecting heifers for their future herds. Few farmers can expect to increase the production of their herds by buying cows from outside. In this connection we have been very deeply impressed with certain figures provided for us by the Agricultural Experiment Station of the College of Agriculture, Berkeley, California, U.S.A., by which it appears that, taking the last year in record, 1917, the six young heifers selected by one Cow-Testing Association, and coming into milk for the first time, gave the following remarkable butter-fat yields:—482.30 lbs., 208.25 lbs., 616.77 lbs., 248.86 lbs., 314.67 lbs., and 301.79 lbs. The average of the butter-fat of these six cows, in their first year's milk, is 360 lbs. If this be taken as equal to about 420 lbs. of butter, it will be seen that at 2/- a pound this gives an average value of £42 per cow on butter alone, apart from the value of the skim milk and calf. It is stated by the College of Agriculture, Berkeley, that this result was achieved by careful selection from farmers' own herds, as a result of records, and could not otherwise have been attained.

28. It is of importance to notice the difference affected during the seven years of such records. This particular Cow-Testing Association, from whose records we have quoted, began its operations in 1909. The eight young heifers chosen for the following year, 1910, gave the following butter-fat yields:—264.4 lbs., 254.9 lbs., 243.1 lbs., 330.9 lbs., 309.9 lbs., 274.3 lbs., 252.2 lbs. and 184.2 lbs. That is to say, after one year's records, the average of butter-fat among the heifers selected for future milking was 276 lbs. Within seven years this was increased to 360 lbs.—an average grading-up of 90 lbs. of butter-fat yield per heifer selected, on the first year in milk.

FEEDING.

29. A cow cannot reach her highest limit of milk production unless she is supplied with proper food-stuffs, properly proportioned. Cows can be fed for the quantity and quality of the milk they yield. Feeding will not change a bad milker into a good milker, but it will improve a good milker, especially if care be taken to adjust the feeding of each cow to her milk yield.

CONTAGIOUS ABORTION.

30. On account of the great prevalence of Contagious Abortion, and the very serious national loss so caused, we are strongly of the opinion that, in the interests of all farmers alike, it should be made a notifiable disease. It is important to note that, in so far as the facts can be ascertained, Contagious Abortion is no greater a scourge in countries where the yield of milk is twice as high as in Ireland. It would seem that the degree of the scourge in these countries is even less than in Ireland, owing to the cleanlier and more sanitary methods that are enforced or adopted.

STORES.

31. Among the arguments which we have encountered, why farmers do not keep careful records with a view to breeding for milk production, is that they also desire cows that will throw good Stores. At the outset we should say that it has not been shown that the 700 gallon cow will throw any worse Store than the 300 gallon cow. In any case, with milk reckoned at 1/- a gallon, the 300 gallon cow earns £15; the 700 gallon cow earns £35. That is to say, there is a difference in milk on the one calving operation, between the two, of £20. Even if we assumed that the calf of the 300 gallon cow were worth so much as £5 more in the market than the calf of the 700 gallon cow, it still remains true that the 700 gallon cow earns £15 more on both calf and milk. In our judgment, however, it is fairly clear that at least as good a price would be got for the calf of good milking stock as for the calf of indifferent or bad milking stock.

32. Under this section of our Report, we desire to say that, by the measures we have suggested, one great incidental benefit would accrue. Farmers in the Dairy Districts of Ireland will require proper dairy records with all cows and bulls they purchase. In that degree they will be protected against cows and bulls bred and reared for other than dairy purposes. And the indrifting of bulls and heifers bred for beef alone will not continually tend, as it does now, to the pulling down of proper milking records.

REGULAR MILKING.

33. It is of great importance that cows should be milked at regular intervals, morning and evening. Few things will more quickly cause a cow to go off milk than a failure thoroughly to empty her udder at regular periods, and there can be little doubt that much harm is now being caused by the neglect of this very important matter. It is equally important that cows should be thoroughly " stripped." This is not only essential for the cow herself, but it is of greater importance to the farmer, as it is always in such " strippings " that the greater percentage of the butter-fat is contained. The percentage of butter-fat in the first milking and the "stripping" can be seen in the following figures :—

A cross-bred Guernsey gave at one milking 15 lbs., with a butter-fat percentage of 3.7. Its milking was divided into three sections of 5 lbs. each.

The 1st gave a butter-fat percentage of 1.6.
The 2nd ,, ,, ,, 3.6.
The 3rd ,, ,, ,, 5.9.

Another cow gave a butter-fat percentage of 5. Its milking was divided into six sections.

The 1st gave a butter-fat percentage of 0.9.
The 2nd ,, ,, ,, 2.6.
The 3rd ,, ,, ,, 4.2.
The 4th ,, ,, ,, 4.4.
The 5th ,, ,, ,, 7.5.
The 6th ,, ,, ,, 10.5.

PERIOD OF CALVING.

34. Lastly, we would draw the attention of farmers to the well-founded experience that cows calving in the months of October, November, and December, usually yield from 100 to 150 gallons more milk than if they were to calve in April and May, and considerably more than if they were to calve in the month of June. This is a matter that is involved with the vexed question of Winter Dairying, with which we do not now propose to deal. Yet we judge it necessary, as a final word on this question of milk production, to emphasise that the period of the year in which a cow calves has a material effect on her milk yield.

RECAPITULATION.

35. Our recommendations are, therefore, in brief : —

COWS.

(*a*) Introductory to the establishment of proper Cow-Testing Associations, with proper Supervisors, that Creamery Managers should record for the information of each farmer his position, month by month. This can be effected by the following simple measures, that need only entail the keeping of an extra column in the Manager's book. The Manager should be informed by each supplier of the exact number of cows being milked by him. By checking this with the amount of milk supplied, the farmer will be able to know at once what is the average yield of his herd, in order to compare it with the average yields of his neighbours. Thus emulation would be stirred, and an incentive supplied for the creation of a proper Cow-Testing Association, while the farmer himself would become familiarised with the general idea of such Associations.

(*b*) Further, that proper Cow-Testing Associations should at once be established by all farmers, as a matter of self-help and ordinary business efficiency. Where Creameries exist they form natural centres for such Associations. It should be the business of every Creamery Committee in the country to see that Supervisors are appointed to work from the Creamery as their base of operation. This should be begun with farmers who under (*a*) show the worst average, with a view to helping them to discover the particular cows that are pulling down their average. In due course all farmers who supply the Creamery would be brought within the scheme. It is not possible for a Supervisor effectively to undertake the examination of more than a certain number of farms. Therefore, as the scheme develops, suppliers should be grouped together, district by district, each group of suppliers having its own Supervisor. As it is of the very first importance that a Supervisor should not be subject to any human influence in the taking of records, it would be desirable if they were moved about from group to group month by month. Supervisors, where they now exist, are paid in most cases an unsatisfactory wage. Skilled work of this kind should be properly paid. Part of the cost might be borne by a weekly contribution from farmers directly, and the remainder by the Creamery. Such expenditure would prove a sound investment, and would certainly prove a more profitable employment of money than to leave it lying in the bank.

(*c*) In districts where Creameries do not exist—and even in districts where Creameries do exist, supposing these Creameries have not sufficient initiative to undertake this work,—the work should be undertaken by parishes and chapel-areas. Those who wish to do effective work for the country can help greatly by bringing meetings of farmers together with a view to the establishment of such Cow-Testing Associations.

(*d*) That Cow-Testing Associations, whether formed in conjunction with a Creamery or independently, should be represented in a National Dairy Council. One of the functions of this Council should be to bring about a uniformity of practice throughout the country within Cow-Testing Associations, and also to undertake propaganda in parts of the country where Cow-Testing Associations have not been established, with a view to bringing the whole country into one uniform scheme.

(*e*) Active propaganda should at once be set up with a view to bringing the above measures into effect. The best methods must needs fail until the public mind is aware of their necessity, and the question is largely a matter of education. It is important, therefore, that active propaganda should be carried out by National workers, in order that farmers who remain content with the present state of affairs, and do not at once take measures to remedy them, should be charged before their fellows with national negligence.

BULLS.

(*a*) That for a beginning one Stud Farm should be established in each Province, and that its books and records should be kept on strict lines. These Stud Farms should be established in suitable Dairy Districts—preferably where there are no well-equipped Stud Farms at present. For all such farms bulls of the best milking strains should be purchased, in order that before their service to neighbouring farmers, at proper fees, they may be tested on the home farm. Then when the stock is sufficiently increased, and is tested and approved, heifers might be sold to neighbouring farmers, and bulls in the same way sold, or let out to trustworthy persons for use in their neighbourhood at approved fees and conditions, provision being taken in all cases to ensure against their export from the country. Preference should be given to farmers belonging to Associations.

(*b*) That bulls of a dairy pedigree should be certificated; that farmers should not permit service by a bull without a certificate; and that this certificate should state the dam and the sire of the bull so certificated.

(*c*) That no certificated bull should be sold before seven years, unless under exceptional circumstances.

(*d*) That bulls as well as heifers should be registered by name and number; that farmers when purchasing milch cattle should insist on knowing their sires and their dams; and that both sires and dams should be entered at the head of each separate record.

(*e*) That any bull that fails to produce a good milking strain should be fattened for beef, or removed to a non-dairy district before further damage is done to dairy herds.

(*Signed*),

THOMAS JOHNSON, *Chairman.*
WALTER L. COLE.
J. C. DOWDALL.
E. E. LYSAGHT.
MAURICE MOORE.
JOHN MURPHY.
A. J. NICOLLS.
STEPHEN M. O'MARA.
LIONEL SMITH-GORDON.
JOHN SWEETMAN.
R. N. TWEEDY.

DARRELL FIGGIS, *Secretary.*
22nd March, 1920.

APPENDIX I.

TABLE OF HOLDINGS ABOVE 1 ACRE IN IRELAND.

Class of Holding.	Total Number.	Total Number of Cows.	Percentage of Total Cows.	Total Acreage under Crops and Grass.
Above 1 and not exceeding 5 acres	47,619	28,186	1.9	157,174
Above 5 and not exceeding 50 acres	321,335	801,567	54.4	6,061,458
Above 50 and not exceeding 100 acres ...	57,476	359,328	24.4	3,276,457
Above 100 and not exceeding 200 acres ...	23,159	192,957	13.1	2,422,143
Above 200 and not exceeding 500 acres ...	8,231	70,470	4.8	1,607,154
Above 500 acres	1,967	20,792	1.4	771,227
Total ...	459,787	1,473,309	100.0	14,295,613

APPENDIX II.

COW-TESTING APPARATUS.

(To Start a Station for an Association).

For Milk Testing.

This divides itself under two heads :—

Quantity Testing.

Quality Testing.

For Quantity Testing the following appliances are required :—

	£	s	d
(1) A Spring Balance weighing 40lbs., marked in ½lbs., each	0	17	3
(2) A Gauge Pail ... ... each	0	16	0
(3) A Stock of Sample Bottles (5oz. capacity) ... ... per doz.	0	4	6
(4) A Sample Dipper	0	0	9
Total ...	£1	18	6

A suitable box to hold Sample Bottles, to be made by a carpenter.

For Quality Testing :—

	£	s	d
A 24-bottle Centrifuge, free-wheeled, and Speed Indicator ...	11	0	0
30 Accurate Test Bottles	4	10	0
1 Hot Water Bath (Copper, with fittings)	1	5	0
1 Suitable Lamp	0	15	0
1, 1c.c and 1, 10c.c. and 3, 11c.c. Pipettes	0	10	0
1, 250c.c. Burette and 1 50c.c. Pipette	1	5	0
1,000 Preservative Pellets	0	3	6
7lbs. Small Shot	0	5	0
14lbs. Washing Soda	0	1	0
20lbs. Sulphuric Acid, 1.825 Sp.G., at 4d. per lb., and bottle	0	8	0
Amyl Alcohol, .815	0	7	6
1 Chemical Thermometer	0	4	6
Total ...	£20	14	6

1 Stand to hold Bottles.

It should be noted that the above prices are subject to variation.